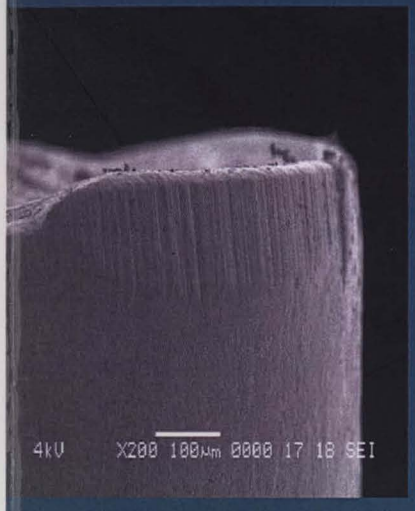

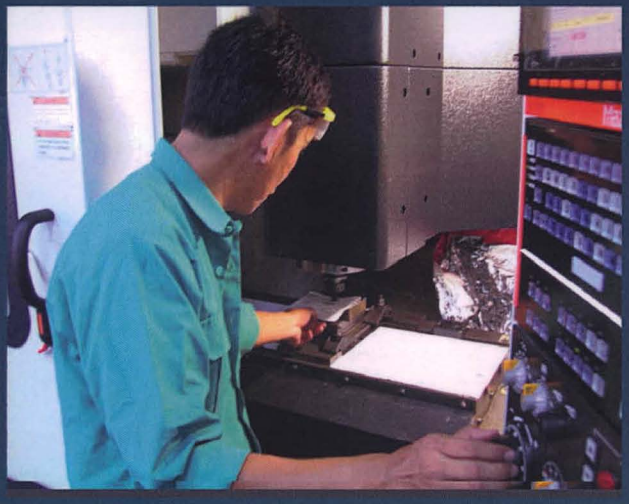

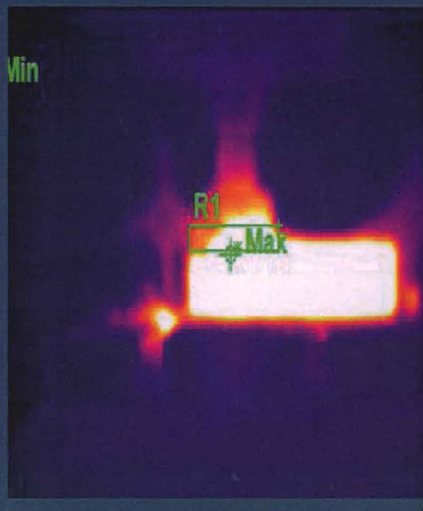

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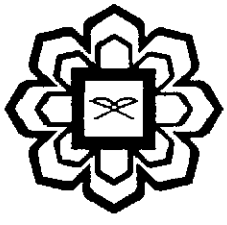

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PART III: MATERIALS

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Chapter 17

The Effect of Stucco System in Ceramic Shell Investment Casting

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1. Introduction

Investment casting method is preferred in fabricating hip-bone. Investment casting yields a finely detailed and accurate product, with excellent metallurgical properties (Banga, 2007). Moreover, intricate shapes can be made with high accuracy (Ramana Rao, 2003).

Ceramic shell development is one of the most important procedures in investment casting. There is no proper rule for repetitive procedure of making layers and drying the ceramic shell in order to achieve appropriate thickness and strength (Beeley and Smart, 1995). Therefore, this study may benefit a lot in terms of cost reduction and time saving while promising a better quality of the product.

Thus, an attempt has been made in this study to prepare an acrylic die halves as part of the investment casting process.

2. Literature Review

2.1 Application of Investment Casting In Total Hip Replacement

Investment casting is also known as lost-wax casting. Basically, in investment casting process, ceramic slurry is applied all around the surface area of a disposable pattern and allowed to dry and harden to become a disposable casting mold.

Due to technological advances, ceramic shell investment casting process has sustained continued development and become the most versatile modern metal casting technique. Ceramic shell moulds are used primarily for investment casting of carbon and alloy steels, stainless steels, heat resistant alloys, and other alloys with melting points above 1087°C. Ceramic moulds with very low green strengths are prone to crack during wax removal. The raw materials (refractory, binder, wetting agent, and antifoam) used to make slurry play a major role in determining the overall final ceramic